

TERRITORY OF AMERICAN SAMOA §305(b) WATER QUALITY ASSESSMENT

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**Territory of American Samoa
2002**

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I Overview

The American Samoa Environmental Protection Agency (ASEPA) has a responsibility to monitor, assess and protect the water quality for the Territory of American Samoa. U.S. federal and American Samoa local environmental legislation and regulations all apply in American Samoa.

This report has been prepared to comply with Section 305(b) of the Clean Water Act, which requires a biennial reporting on water quality to the U.S. Congress. It is also designed to provide information for ASEPA's Interagency Watershed Protection Task Force, as well as other interested parties. Water quality and associated data from 2001 was used to complete this report.

i Geographical Summary

The Territory of American Samoa lies roughly 14 degrees south of the equator between longitude 169 and 173 west, and about 2,300 miles southwest of Hawaii. The population of the territory, according to the 2000 census, was 57,291 people. The principal islands are Tutuila, Aunu'u, and the Manu'a islands; a cluster of three islands, Ta'u, Ofu and Olosega, located about 65 miles east of Tutuila. Swains Island, a small island with a population of less than 25 and Rose Atoll, an uninhabited atoll about 120 miles east of Tutuila make up the remainder of the territory.

The islands of American Samoa are of volcanic origin and exhibit the rugged topographic relief common to the Pacific volcanic islands. The climate of the territory is tropical, with uniform high temperatures and high humidity throughout the year. Mean daily temperature during the year varies from about 78 to 82 degrees Fahrenheit. The maximum altitude is about 3,180 ft. above mean sea level at the summit of Lata Mountain on Ta'u Island. Tutuila, with an area of 53 square miles, is the largest and most populated island in the territory. It is approximately 20 miles long and ranges in width from less than one mile, to a maximum of 5 miles at the Tafuna-Leone plain. A sharp-crested ridge 1,000 to 2,000 feet high with steeply eroded slopes dominates the entire length of the island.

The steep, variable topography of Tutuila effects localized rainfall amounts. The airport at Tafuna receives about 125 in. (3,180 mm) but Pago Pago receives nearly 200 in (4,090 mm). The crest of the range at Mt. Alava, altitude 1,600 ft. (914 m), receives considerably more than 250 in (6,350 mm). The driest months are June through September and the wettest are December through March, but heavy showers can occur in any month. The 1999 revision of the American Samoa Water Quality Standards (ASWQS) describes six water classifications for the territory: Fresh Surface Waters, Ground Waters, Wetlands, Embayments, Open Coastal Waters and Ocean Waters.

ii Territorial Water Quality Review

Fresh Surface Waters

The small, steep watersheds and periodic intense rainfall cause stream flows to fluctuate quickly. Despite highly variable flows, the streams of American Samoa are able to support a variety of aquatic species, several of which may be harvested for consumption. Designated uses include potable water supplies, support of indigenous wildlife and aesthetic and recreational enjoyment. Stream water quality is most affected by development along a stream that changes the hydrology and shade along a stream, by development within a watershed that causes erosion and increased turbidity, and by nutrient pollution from poorly constructed human and pig waste disposal systems. In some areas, improved service by sewage lines and subsequent decrease in the number of poorly constructed septic systems has improved the water quality of streams.

The majority of the drinking water for the population is provided by the government system, however there are outlying villages that continue to use surface water diversions as a source of drinking water.

Ground Waters

The Tafuna-Leone plain is the site of the majority of American Samoa's residential and business development. The plain is also the site of the majority of the wells that pump ground water for distribution. Because volcanic stratum of Tutuila is highly permeable and does not have a great capacity to filter, there is a constant risk of groundwater contamination as pollution migrates from the surface with rainwater. The greatest threats to groundwater quality in American Samoa are pesticide residues, pollutants associated with automobiles, and pathogen and nutrient pollution from poorly constructed human and pig waste disposal systems. As in many small tropical islands with highly permeable soils, the fresh water aquifer floats on layer of salt water beneath the ground. Rare dry periods of two to three month duration result can in critical drinking water shortages as salt water intrudes on the depleted fresh water lens aquifer. The territory suffered its worst drought of historical record in 1974. In 1998 the Territory experienced a drought, but not as severe as the 1974 drought and there was not a noticeable increase in chlorides in the drinking water.

Wetlands

American Samoa possesses a number of small but very important wetland habitats. The wetlands include coastal mangrove swamps, inland freshwater marshes and some cultivated *taro* fields. Designated uses include support of indigenous aquatic and terrestrial life, fishing, food cultivation and gathering, recreation, flood control and groundwater recharge. Wetlands in the territory are being lost or degraded by urban growth and development as a result of population increase. Biosystems Analysis, in their wetlands management plan, calculated that between 1961 and 1990, 23 percent of American Samoa's wetlands have been lost.

Embayments/Open Coastal Waters

Embayments and ~~Open Coastal Waters~~ open coastal waters in American Samoa are characterized by the fringing coral reefs that surround all of the islands in the territory. Designated uses include fishing and food gathering, recreation, support of marine life, mariculture, and scientific investigations. The reefs also provide a buffer for the islands against the impact of waves. The greatest threats to near-shore water quality and to the health of the reefs in American Samoa are from run-off from the land, especially pathogen and nutrient pollution from poorly constructed human and pig waste disposal systems as well as increased turbidity and nutrients from erosion. Solid waste, i.e. improperly disposed of trash, is another source of pollution in open coastal waters and embayments.

Pago Pago harbor is the most industrialized embayment in the territory, with over a century of development subsequent to the creation of the territory under the United States. As well as the sources of water quality impairments mentioned above for embayments in general, Pago Pago harbor is ~~ea~~ffected by pollution from marina and port traffic, a small shipyard, and in the outer harbor effluent from the tuna canneries and sewage treatment plant, ~~both~~ hall of which have National Pollutant Discharge Elimination System (NPDES) permits. Due to the segregation and transportation of cannery waste beyond the inner harbor, better treatment of sewage and more effective monitoring and prosecution by the Coast Guard of commercial vessels that pollute the harbor, the water quality in the inner harbor has improved noticeably in the last decade.

There are special management areas within the territory's open coastal waters including Fagatele Bay National Marine Sanctuary, the Territorial Marine Park on Ofu and the National Park, Ofu segment.

Ocean Waters

Designated uses include fishing, scientific investigations, boating, support of marine life, ~~and~~ recreation. While there is a small offshore fishery, it is unknown whether offshore waters are affected by pollution. High strength wastes from the tuna canneries are dumped five miles offshore, but it is doubtful that the waste has more than a localized effect.

General Trends in Water Quality

The Pago Pago harbor is the only water body that has a trend of improved water quality since the segregation and ocean dumping of high strength wastes and the movement of the low strength waste outfall to the outer harbor. While there is little data, it is generally believed that water quality has decreased in streams in populated areas, most embayments ~~nearshore waters~~, nearshore waters, and wetlands.

iii Water Quality Protection and Coverage

The federal NPDES program regulates point source discharges of pollutants to the waters of American Samoa. EPA Region 9, with the assistance of the ASEPA, administers the permit program. There are five industrial and two municipal facilities with NPDES permits. On February 3, 1987, renewed NPDES permits for both canneries were issued.

These permits required the canneries to improve or alter their wastewater treatment process so that within five years the quality of wastewater discharged into Pago Pago Harbor met the American Samoa Water Quality Standards (ASWQS). The canneries met this deadline by extending their low strength discharge outfall to the outer harbor and by barging their high strength waste five miles out of the harbor. In 2001, the StarKist and COS Samoa tuna canneries were re-issued NPDES permits. These permits are in effect for five years. Changes to the monitoring requirements contained within the new permits are summarized in Section III.C, Existing Networks and Programs.

The Construction Grant Program administered by the American Samoa Power Authority (ASPA) completed construction of the Pala Lagoon sewer system in 1990. The majority of homes in the Tafuna and Nu'uuli area, including those that may have been a source of pollution to Pala Lagoon are now serviced by this system. Sewage is transported to the Tafuna Sewage Treatment Plant (STP) for primary separation and discharge through a deep ocean outfall.

The American Samoa Coastal Management Program (ASCMP) leads wetlands protection activities in the territory. The Wetlands Management Plan for Tutuila and Aunu'u Islands was completed in FY92. The ASCMP has completed a number of activities for wetlands protection including delineation and signage, public education and tours of local wetlands. The American Samoa Wetlands/Stream Restoration and Enhancement Plan was finalized by a contractor for ASEPA in 2001. ASEPA and ASCMP cooperate to implement wetland and riparian habitat restoration projects discussed in the Enhancement Plan.

Currently, several efforts are directed toward groundwater protection. The Ground Water Use Plan (1988) completed by the Environmental Quality Commission (EQC) ties together all government programs on ground water protection. All elements of the plan have been completed. Since 1989, ASEPA has entered into a yearly cooperative agreement with the U.S. Geological Survey (USGS) to provide for further ground water investigations. The USGS continues to gather stream flow, rainfall and evapotranspiration data on the island of Tutuila. This data will be used to model rainfall and groundwater aquifers on the island. ASEPA and the American Samoa Power Authority (ASPA) are collaborating on a Groundwater Protection Plan that will be completed in 2003.

Limited water quality monitoring in the territory is performed on a bi-weekly and quarterly basis by the ASEPA water quality laboratory. Pago Pago harbor is monitored by NPDES permittees to document compliance with their permits. The water quality monitoring plan for the territory is being updated in 2002 will be implemented in 2003. As a participant in President Clinton's Coral Reef Initiative, the ASEPA cooperates with local agencies to monitor water quality in key embayments around the island. Initial data logging multiprobes have been received and will likely be deployed in 2002. A stream monitoring program will be initiated as part of the category one watersheds protection plan. The canneries, as required by their new NPDES permits will be required to monitor additional parameters.

II Background

i Total Waters

Table 1. Atlas Description of American Samoa

Topic	Value
Territorial Population	57,291*
Territory Surface Area (square miles)	76.1
Total Miles of Streams (miles)	169
Square Miles of Coral Reef	184
Miles of Ocean Coast	116
Acres of Fresh Water and Tidal Wetlands	512**

*From 2000 Census

**Estimate from 1991

ii Maps

No change since the 2000 Narrative 305b report.

iii Water Pollution Control Program

A. Watershed Approach

No change since the 2000 Narrative 305b report.

B. American Samoa Water Quality Standards (ASWQS) Program

No change since the 2000 Narrative 305b report.

C. Point Source Program

No change since the 2000 Narrative 305b report.

D. Nonpoint Source Control Program

In 2001, four documents were submitted to National Oceanographic and Atmospheric Administration (NOAA) and USEPA that addressed remaining conditions for full approval of the American Samoa Nonpoint Source Management Program. Two of these documents justified and requested exemptions from Management Measures for Marinas and Nutrient Management Measures for Animal Waste Control Facilities. Exemptions for these measures were granted in 2001. Two documents responded to conditions for approval with regard to the Pesticide Management Measure and the Onsite Disposal Systems Management Measure. These documents are still under review by NOAA and USEPA. In 2002, ASEPA will satisfy the remaining condition for full approval when a monitoring plan for Nonpoint Source Pollution is completed.

E. Coordination with Other Agencies

ASEPA did not establish the piggery waste revolving fund to supplement the Environmental Quality Incentives Program (EQIP) administered by the NRCS. ASEPA made a programmatic decision to focus on public outreach and technical assistance in agricultural research with regard to pollution from piggeries. ASEPA will no longer contribute resources to efforts to build improved piggeries with private individuals.

iv Cost/Benefit Assessment

No change since the 2000 Narrative 305b report.

v Special Territorial Concerns and Recommendations

No change since the 2000 Narrative 305b report.

III Surface Water Assessment

i. Current Surface Water Monitoring Program

A. Purpose of the Monitoring Program

No change since the 2000 Narrative 305b report.

B. Coordination/Collaboration

The ASEPA Recreational Beach Monitoring Program was improved and expanded in 2001. One improvement is increased collaboration between ASEPA and the print, radio and television media to communicate the results of testing that indicate that bacteria concentration at beaches are in violation of the ASWQS and unsafe for swimming.

In 2001, ASEPA and ASPA coordinated sampling of groundwater using finished water from drinking water wells throughout the territory. These samples were analyzed as part of the Baseline Chemical Contaminants Monitoring Program. This program examines all active groundwater wells that provide drinking water to the territory for chemical constituents regulated under the Safe Drinking Water Act.

C. Existing Networks and Programs

- **Tuna Canneries' NPDES Receiving Water Quality Monitoring Program**

The two tuna canneries are required to jointly monitor the water quality of Pago Pago Harbor under their current 5-year NPDES permits (2001-2005). Water column parameters are monitored semi-annually to determine compliance with permit requirements and the American Samoa water quality standards. There are nine sampling stations in a fixed station network, designed for comprehensive coverage of the harbor. Parameters for the water quality monitoring program include: Temperature; Salinity; Dissolved Oxygen; pH; Turbidity; Light Penetration; Suspended Solids; Chlorophyll a;

Total Nitrogen; Ammonia Nitrogen; Total Phosphorus; and trace metals (As, Cu, Hg, Pb, Zn).

- Tuna Canneries' NPDES Fish Toxicity Study

The two tuna canneries are required to jointly implement a fish toxicity study for Pago Pago Harbor under their current 5-year NPDES permits (2001-2005). The study will be completed in 2002. Whole organism tissues from a variety of vertebrate and invertebrate species found in the inner Pago Pago harbor were analyzed for As, Hg, Pb, and PCBs.

- Tuna Canneries' NPDES Sediment Monitoring Program

The two tuna canneries are required to jointly monitor sediments of Pago Pago Harbor under their current 5-year NPDES permits (2001-2005). Sediment parameters will be monitored twice under the current permits to assess concentrations of contaminants of concern. Sediment monitoring is conducted to determine the character of the sediments in relation to long term discharges from the canneries' outfall, and to determine if overall harbor quality will be affected by the re-suspension of contaminants of concern. There are seven sampling stations in a fixed station network within the harbor. The first sediment sampling event was completed in 2001. The second sampling event is scheduled for 2004. Parameters of the sediment monitoring program include: Total Nitrogen; Total Phosphorus; Total Sulfides; Redox Potential; Total Organic Carbon; Percent Solids; Total Volatile Solids; Grain Size distribution; and trace metals (As, Cu, Hg, Pb, Zn).

- Tuna Canneries' NPDES Coral Reef Survey

The two tuna canneries are required to jointly implement two coral reef surveys for Pago Pago Harbor under their current 5-year NPDES permits (2001-2005). Surveys will assess the impacts of the canneries' outfall discharge on nearby coral reefs. Transects are on a fixed station network within the harbor, near the villages of Aua and Anasosopo. The first survey will be completed in 2002. The second survey is scheduled for 2005.

- ASPA NPDES Receiving Water Quality Monitoring Program

ASPA monitors water quality in outer Pago Pago harbor and of the southern coast of Tutuila at Fogagogo near the location of outfalls for the two sewage treatment plants on the island. There are eleven sites in a fixed station network sampled quarterly. The parameters sampled for are as follows: Temperature, pH, Suspended Solids, Chlorophyll a, total Nitrogen, Kjeldahl Nitrogen, Nitrate+Nitrite, total Phosphorus.

- ASEPA/USGS Groundwater and Rainfall Study

Since 1989, ASEPA has entered into a yearly cooperative agreement with the U.S. Geological Survey (USGS) to provide for further ground water investigations. The USGS continues to gather data on stream flow, rainfall and evapotranspiration on the island of Tutuila. This data will be used to model rainfall and groundwater aquifers on the island. No reports on this study were published during the reporting period.

- ASEPA Village Water Supply Monitoring Program

Village water systems that rely on surface water are tested for total coliform and *E. coli* monthly. The supplies are always in exceedance of the Water Quality Standards, and monthly health advisories (Boil Water Notices) are issued.

- ASEPA Toxicity Monitoring Program

The Tier II fish toxicity study will provide a risk assessment for the consumption of fish and shellfish from throughout the territory. All organisms have been collected and processed. The laboratory data and the risk assessment will be complete by the end of 2002.

- ASEPA Recreational Beach Monitoring Program

The ASEPA Recreational Beach Monitoring Program was improved and expanded in 2001. The ASEPA now monitors popular recreational beaches on Tutuila and in Manua on three schedules. Fourteen popular, centrally located beaches are sampled on a weekly basis. Twenty-one less popular, outer beaches are sampled on a monthly or quarterly basis. Samples are analyzed for Enterococci and measurements of turbidity, conductivity, chlorophyll *a*, pH, temperature, salinity and dissolved oxygen are collected. Results for Enterococci are compared with the ASWQS to determine if a beach is safe for swimming. Weekly public notices are released that warn the public of the hazards of swimming at beaches that are in violation of the ASWQS.

- Pago Pago Harbor Water Quality Monitoring Strategy

A priority project that is underway at ASEPA is the "Pago Pago Harbor Water Quality Monitoring Strategy" (PPGH Strategy). The PPGH Strategy will institute a regular monitoring and reporting program for four major components of the marine environment that serve as direct or indirect indicators of water quality. Lead is included among the contaminants that will be monitored within each strategy component. Strategy components include the water column, biota (infauna, epifauna, and nekton), coral reef habitat, and sediments. In addition to the regular monitoring program, several baseline studies will be completed as part of the PPGH Strategy. Of primary importance are the baseline studies that will characterize sediments and sediment flux in Pago Pago Harbor. Sediment studies will include sampling designs that incorporate the entire harbor, from the Vaipito Stream estuary, to the harbor entrance between Niuloa Point and Faataaga Point.

One goal of the sediment studies within the PPGH Strategy is to determine non-point sources of lead in the Pago Pago Harbor watershed. At this time, indications are that harbor sediments are the primary non-point source for lead in Pago Pago Harbor. Moreover, indications are that lead in sediments is of historic origin, and that present-day lead loads to the harbor are insignificant. Harbor sediment studies will make it possible to determine if these indications are valid. Sediments provide a geologic record of harbor activities. This record can be associated with, or substantiate, written histories to identify suspect areas of source lead. Similarly, the baseline studies will provide a profile of lead concentrations in sediments along transects taken at interval stations for the whole length

of the harbor. This information will serve to identify "hotspots", that can in turn be evaluated to determine if terrestrial investigations within the watershed are warranted.

- **ASPA Groundwater Sampling**

In 2001, ASEPA and ASPA coordinated sampling of groundwater using finished water from drinking water wells throughout the territory. These samples were analyzed as part of the Baseline Chemical Contaminants Monitoring Program. This program examines all active groundwater wells that provide drinking water to the territory for chemical constituents regulated under the Safe Drinking Water Act.

- **Department of Marine and Wildlife Resources**

DMWR monitors trends in nearshore fisheries resources on Tutuila through creel surveys and catch-per-unit effort calculations. The department also conducts surveys of coral reef habitats at sites on Tutuila. As part of the Community Based Fisheries Management Program, DMWR and participating villages will monitor the recovery of fishery resources in reserve areas. No reports of fisheries monitoring activities were published for the reporting period.

- **The National Park of American Samoa (NPAS)**

NPAS will monitor physical and chemical parameters of streams within the National Park to establish baseline indicators and trends in stream water quality. NPAS will monitor coral reef habitat quality in marine units of the park, and conduct fishing use surveys in areas that are used for subsistence fishing. No reports of monitoring within NPAS were published for the reporting period.

- **Coral Reef Advisory Group**

As a participant in President Clinton's Coral Reef Initiative, the ASEPA is cooperating with other local agencies to monitor water, biological community and habitat quality in marine waters of the territory. A workshop to plan collaborative coral reef monitoring in the territory will be completed in 2002. ASEPA will contribute to this collaborative effort, and will ensure that it satisfies the ASEPA mandate to monitor the quality of embayments, open coastal waters, and ocean waters.

D. Laboratory Analytical Support

In 2001, the ASEPA Laboratory and laboratory staffs were re-certified for microbiological analysis of drinking water for Total Coliform and *E. Coli*. A representative from the USEPA Region 9 Water Quality Laboratory completed the certification. The laboratory can no longer analyze for BOD or Suspended Solids, but now has the capability to perform analyses of pH and turbidity in the lab.

E. QA/QC Program

No change since the 2000 narrative 305b report.

F. Data Storage, Interpretation and Communication

NPDES permittees submit hard-copy reports of all their monitoring activities to ASEPA. These reports are organized, stored, and are available to the public at the ASEPA office. Data storage and interpretation of the results of the Recreation Beach Monitoring Program and Village Water Supply Program has improved in 2001 as a result of improved supervision and laboratory QA/QC procedures. Data is stored in binders and will be kept for five years. Communication of the results of these ASEPA programs to the public has improved as a result of an expanded collaborative effort between ASEPA and the media.

ii. Status of Plan to Achieve Comprehensive Assessments

In 2001, The ASEPA water quality laboratory staff improved their capacity and knowledge through in-house training and classes at the American Samoa Community College. The laboratory was moved to a new location and the laboratory procured new equipment and supplies including a new incubator, fume hood, and autoclave. More stringent QA/QC controls were enacted for all laboratory samples and analyses. Data Quality Objectives and Standard Operating Procedures documents were developed for the Recreational Beach Monitoring Program. ~~The most recent water quality monitoring strategy was completed in 1981, implemented in 1984.~~

In 2002 and 2003, monitoring programs and associated documents will be developed for all territorial water bodies. The expanded water quality monitoring program will be designed to be statistically rigorous and to satisfy USEPA guidelines for water quality monitoring programs. All categories of water bodies will be depicted and inventoried in the program. Sampling locations will be georeferenced with GPS as a collaborative effort with the American Samoa Coastal Management Program (ASCMP). ASCMP is leading an effort to create a territorial GIS, and has the technical staff and equipment to incorporate georeferenced data into that GIS. ~~All of these new sampling~~

ASEPA will compile data from the expanded water quality monitoring program, along with data from all other available sources to determine designated use support. Trends in waterbody designated use support, along with Nonpoint Source Best Management Practice (BMP) implementation information, will be tracked on a watershed-by-watershed basis. The total surface area of American Samoa is very small, only 76.1 sq miles. This small surface area is divided into 41 watersheds. Accordingly, tracking on a watershed scale will allow the Territory to achieve comprehensive assessments with the limited resources available.

iii. Assessment Methodology/303d Waters

A. Assessment Methodology

1. The 2002 305b Report

ASEPA assembled and evaluated all existing and readily available data and information from sampling and analyses completed in 2001, including data and information relating to the categories of waters specified in 40 CFR§130.7(b)(5).

For this 2002 report, multiple uses based on current water quality standards have been assessed. The primary uses for water bodies in the territory are:

- 1 Potable water supplies
- 2 Support and propagation of indigenous aquatic and terrestrial life
- 3 Compatible recreation and aesthetic enjoyment
- 4 Fish and Shellfish consumption

Specific criteria for determining attainment of these individual uses have been incorporated in accordance with the federal guidance Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates (USEPA 1997) and are described below in detail.

Biases incorporated into assessments included:

- Small percentage of waters assessed.
- Limited monitoring of waterbodies affected by non-point sources.
- Utilization of data is of unknown or low or low to moderate precision and sensitivity.

Extent of waterbodies represented by a single assessment or monitoring site:

- Streams - 2 miles unless stream specific data demonstrates otherwise.
- Embayments/Open Coastal - 1 mile
- Open Ocean Water - 4 mile radius

2. Types of Assessment Information

Two types of assessment information were utilized. They are “Evaluated” and “Monitored”. “Evaluated waters” are those for which the use support decision is based on information other than site-specific ambient data. This includes data on land use, location of sources, and best professional judgment of qualified biologists. “Monitored waters” are those for which the use support decision is principally based on current, site-specific, ambient monitoring data believed to accurately portray water quality conditions. Minimum data collection within monitored waters is quarterly.

3. Guidelines for Determining Levels of Use Support for Primary Uses.

3.1 Potable Water Supplies

There are five village systems in outlying areas that continue to use surface water for drinking water supply. The guidance provided in the federal 305(b) guidelines was used to make use determinations. Monitoring of the village systems to ensure compliance with the Safe Drinking Water Act (SDWA) provides the best data related to use restrictions, including:

- Contamination-based drinking water supply advisories lasting more than 30 days per year; and
- Public water suppliers requiring increased monitoring due to confirmed detections of one or more contaminants.

The following table, taken from the federal guidelines, illustrates the assessment framework used to make use support decisions.

Table 3. Assessment Framework for Determining Degree of Drinking Water Use Support

Classification	Monitoring Data		Use Support Restrictions
Full Support	Contaminants do not exceed water quality criteria	and/or	Drinking water use restrictions are not in effect.
Full Support but Threatened	Contaminants are detected but do not exceed water quality criteria	and/or	Some drinking water use restrictions have occurred and/or the potential for adverse impacts to source water quality exists.
Partial Support	Contaminants exceed water quality criteria intermittently	and/or	Drinking water use restrictions resulted in the need for more than conventional treatment with associated increases in cost.
Nonsupport	Contaminants exceed water quality criteria constantly	and/or	Drinking water use restrictions resulted in closures.
Unassessed	Source water quality has not been assessed for contaminants used or potentially present.		

3.2 Support and Propagation of Indigenous Aquatic and Terrestrial Life

Of the four data type categories (biological, habitat, toxicological and physical/chemical), three categories, physical/chemical, habitat and biological, were used for Aquatic Life Use Support (ALUS) determination during this reporting period. ASEPA conducted limited physical/chemical monitoring during this reporting period. ASPA and the canneries conducted limited toxicant monitoring (priority pollutants and metals) and limited physical/chemical monitoring during this reporting period. The American Samoa Community College and the Fagatele Bay National Marine Sanctuary conducted limited physical/chemical and biological monitoring during this reporting period. These data are of varying data quality levels as per the hierarchy of data levels for evaluation of aquatic life use attainment of the 1997 305(b) EPA guidance. The guideline for determining ALUS using more than one type of data is shown in Table 4 below.

Table 4. Determination of ALUS Using More Than One Data Type

ALUS Attainment	
Fully Supporting:	No impairment indicated by all data types.
Fully Supporting but Threatened:	No impairment indicated by all data types; one or more categories indicate an apparent decline in ecological quality over time or potential water quality problems requiring additional data or verification or other information suggest a threatened determination.
ALUS Non-Attainment	
*Partially Supporting:	Impairment indicated by one or more data types and no impairment indicated by others.
*Not Supporting:	Impairment indicated by all data types.
*A determination of <i>Partially Supporting</i> or <i>Not Supporting</i> could be made based on the nature and rigor of the data and site-specific conditions in the results of the data types. If bioassessment (usually Level 3 or 4) indicates impairment, then a determination of <i>Not Supporting</i> should be made.	

i. Physical/Chemical Methods

Analytical parameters analyzed by ASEPA include Temperature, Salinity, Conductivity, pH, Dissolved Oxygen, Turbidity, Chlorophyll a. These parameters were assessed by the criteria developed by the USEPA for the “Conventional Category”. All of ASEPA’s Physical/Chemical data is considered “Unknown/Low quality”, based on technical components and spatial/temporal coverages, as defined by Table 3-4 in the 1997 EPA guidance document Hierarchy of Physical/chemical Data Levels for Evaluation of Aquatic Life Use Attainment. The ASWQS provides standards for these parameters presented in Table A1 in Appendix A.

ASPA and the canneries collected limited physical/chemical and toxicant data within the reporting period. These data are of Low/Moderate quality based on sampling frequency (annual and semi-annual) and type of sample (grab).

USEPA guidance (1997) states the importance of incorporating the established criteria for conventionals and toxicants in ALUS determinations and to use the “worst case” approach where multiple parameters are available (USEPA, 1997). Tables 5 and 6 below, describe the decision guidelines used for determining ALUS using Physical/Chemical Methods (conventionals data and toxicant data).

Table 5. Decision Guidelines for Conventional (and additional parameters) Used to Assess ALUS in Freshwater Rivers and in Marine Waters

Degree of Aquatic Life Use Support	Criteria
Fully Supporting	For any one pollutant, ASWQS exceeded in ≤ 10 percent of measurements.
Partially Supporting	For any one pollutant, ASWQS exceeded in 11 to 25 percent of measurements.
Not Supporting	For any one pollutant, ASWQS exceeded in > 25 percent of measurements.

Table 6. Decision Guidelines for Toxicants (priority pollutants, metals, chlorine and ammonia) Used to Assess ALUS in Freshwater Rivers and in Marine Waters

Degree of Aquatic Life Use Support	Criteria
Fully Supporting	For any one pollutant, no more than 1 exceedance of acute criteria within a 3-year period based on grab or composite samples and no more than 1 exceedance of chronic criteria within a 3-year period based on grab or composite samples
Partially Supporting	For any one pollutant, acute or chronic criteria exceeded more than once within a 3-year period, but in ≤ 10 percent of samples.
Not Supporting	For any one pollutant, acute or chronic criteria exceeded in > 10 percent of samples.

ii. Habitat Assessment and Bioassessment

In 2001, biologists under contract to the Fagatele Bay National Marine Sanctuary completed surveys of coral reef habitat and reef fisheries resources. The report from the consultant has not yet been published, but anecdotal information from the consultant is used for ALUS determination in this report.

Guidelines from the USEPA guidance (1997) for ALUS determination using habitat assessment data are provided in Table 7 below.

Table 7. ALUS Determination Based on Habitat Assessment Data

Degree of Aquatic Life Use Support	Criteria
Fully Supporting	Reliable data indicate natural channel morphology, substrate composition, bank/riparian structure, and flow regime of region. Riparian vegetation of natural types and of relatively full standing crop biomass (i.e., minimal grazing or destructive pressure).
Partially Supporting	Modification of habitat slight to moderate usually due to road crossings, limited riparian zones because of encroaching land-use patterns, and some watershed erosion. Channel modification slight to moderate.
Not Supporting	Moderate to severe habitat alteration by channelization and dredging activities, removal of riparian vegetation, bank failure, heavy watershed erosion or alteration of flow regime.

Table 8. ALUS Determination Based on Bioassessment Data

Degree of Aquatic Life Use Support	Criteria
Fully Supporting	Reliable data indicate functioning, sustainable biological assemblages (e.g. fish, macroinvertebrates, or algae) none of which has been modified significantly beyond the natural range of the reference condition.
Partially Supporting	At least one assemblage (e.g. fish, macroinvertebrates, or algae) indicates moderate modification of the biological community compared to the reference condition.
Not Supporting	At least one assemblage indicates nonsupport. Data clearly indicate severe modification of the biological community compared to the reference condition.

Data levels for the three data type categories were ranked according to the hierarchy provided in the USEPA guidance (1997).

3.3 Recreation and Aesthetic Enjoyment

The current ASWQS lists fecal coliform as the microbiological indicator for fresh surface waters and *Enterococci* as its indicator for microbiological quality in marine waters.

ASEPA conducts analyses of water quality at popular recreational beaches on a weekly, monthly and quarterly basis (Table A7). No fresh water sites were analyzed.

Microbiological criteria used to determine use support for waters designated for whole body contact recreation are depicted in Table 10 below. This is consistent with

recommendations from the 1997 EPA guidance.

3.4 Fish and Shellfish Consumption

A fish consumption advisory continues to exist for the consumption of fish and shellfish in the inner Pago Pago harbor. The USEPA guidance document (1997) provided classification hierarchy for use support status based on fish/shellfish consumption advisory data as depicted in Table 9 below.

Table 9. Fish/Shellfish Consumption Use Support Determination Based on Advisory Data

Degree of Aquatic Life Use Support	Criteria
Fully Supporting	No fish/shellfish restrictions or bans are in effect.
Partially Supporting	“Restricted consumption” of fish in effect. Restricted consumption is defined as limits on the number of meals or size of meals consumed per unit of time for one or more fish/shellfish species. Or, a fish or shellfish ban in effect for a subpopulation that could be at potentially greater risk, for one or more fish/shellfish species.
Not Supporting	“No consumption” of fish or shellfish ban in effect for general population for one or more fish/shellfish species, or commercial fishing/shellfishing ban in effect.

Table 10. Whole Body Contact Recreation (all surface and marine water designations)

Level of Recreation Use Support	Criteria			
	Fresh Surface Water	Ocean Waters	Embayments: Pago Pago Harbor, Fagatele Bay, Pala Lagoon	All Other Embayments, Open Coastal Waters
Fully Supporting	<u>Fecal coliform</u> : The single sample density does not exceed 200 cfu/100mL AND a geometric mean does not exceed 100 cfu/100mL.	<u>Enterococci</u> : A geometric mean of 35 enterococci per 100mL is not exceeded AND the single sample density does not exceed 276 enterococci per 100mL.	<u>Enterococci</u> : A geometric mean of 35 enterococci per 100mL is not exceeded AND the single sample density does not exceed 104 enterococci per 100mL.	<u>Enterococci</u> : A geometric mean of 35 enterococci per 100mL is not exceeded AND the single sample density does not exceed 124 enterococci per 100mL.
Partially Supporting	<u>Fecal coliform</u> : The single sample density of 200 cfu/100mL is exceeded during the year AND a geometric mean does not exceed 100 cfu/100mL.	<u>Enterococci</u> : The single sample density of 276 cfu/100mL is exceeded during the year AND a geometric mean does not exceed 35 cfu/100mL.	<u>Enterococci</u> : The single sample density of 104 cfu/100mL is exceeded during the year AND a geometric mean does not exceed 35 cfu/100mL.	<u>Enterococci</u> : The single sample density of 124 cfu/100mL is exceeded during the year AND a geometric mean does not exceed 35 cfu/100mL.
Not Supporting	<u>Fecal coliform</u> : The geometric mean standard of 100 cfu/100mL is not met.	<u>Enterococci</u> : The geometric mean standard of 35 cfu/100mL is not met.	<u>Enterococci</u> : The geometric mean standard of 35 cfu/100mL is not met.	<u>Enterococci</u> : The geometric mean standard of 35 cfu/124mL is not met.

B. 303d Waters

Table 11. Territorial 2001 303d List of Waters.

WBID	WB Name and Description	Size of WB Affected	Specific Pollutant or Stressor	Probable Source(s) of Pollutant	Priority for TMDL (H/M/L)	Targeted for TMDL (Yes/No)	No. of NPS Projects in Watershed
	<u>Inner Pago Pago Harbor</u>		<u>Lead</u>	<u>Historical Nonpoint sources</u>	<u>H</u>	<u>Yes</u>	<u>Three</u>

iv. Streams Water Quality Assessment

Using the guidelines presented above, American Samoa's waters were assessed according to levels of use support. This information is presented in Tables A3 through A6 in Appendix A.

Staff of ASEPA and the American Samoa Community college gathered water quality data from streams in the territory. The assessment of this data covers 59.70 miles out of 169 total stream miles. The Assessed Goals were to Protect and Enhance Public Health and Protect and Enhance Ecosystems. All other categories were either "Not Applicable" or "Applicable but no data was available" for this reporting period (Table A3). The Major Causes/Stresses identified for this reporting period were Habitat Alterations and Pathogen Indicators (Table A4). The Major assessed sources of impairment were Collection System Failure and Intensive Animal Feeding Operations, while the Moderate/Minor Sources of Impairment were Collection System Failure, Urban Runoff/Storm Sewers, Hydromodification, Habitat Modification, Natural Sources and Intensive Animal Feeding Operations (Table A5). Trend analyses will be developed as the stream monitoring program is implemented and data accrues.

For the goal Protect and Enhance Ecosystems (Aquatic Life), 48.25 stream miles were assessed. Of those miles, 0.75 were found to be "Fully Supporting", 30.0 were found to be "Fully Supporting but Threatened", 15.5 miles were found to be "Partially Supporting" and 2.0 were found to be "Not Supporting". For the goal to Protect and Enhance Public Health, 2.0 stream miles were assessed for swimming and found to be "Not Supporting". For the goal to Protect and Enhance Public Health, 9.45 stream miles were assessed for drinking water and found "Not Supporting" (Table A3).

v. Embayment/Coastal Waters Assessment

Using the guidelines presented above, American Samoa's waters were assessed according to levels of use support. This information is presented in Tables A7 through A10 in Appendix A.

For this reporting period, limited assessment of was made of embayments and open coastal waters. The total sized assessed in shoreline miles was 26 (Table A10). The

Assessed Goals were 1) Protection and Enhancement of Ecosystems (Aquatic Life) and 2) Protection and Enhancement of Public Health (Fish Consumption and Whole Body Contact Recreation). All other categories were either “Not Applicable” or “Applicable but no data was available” for this reporting period (Table A7). The Moderate Causes/Stresses identified for this reporting period were Metals, Nutrients, Pathogen Indicators and Turbidity. (Table A8). The Moderate/Minor sources of impairment were Collection System Failure, Agriculture, Intensive Animal Feeding Operations and Contaminated Sediments and Natural Sources (Table A9). No trend analyses will be conducted at this time as this is the first reporting period with data. Trend analyses will be developed as the territorial coral reef and marine monitoring program is implemented and data accrues.

For the goal Protect and Enhance Ecosystems (Aquatic Life) all thirteen of the assessed miles were found to be “Fully Supporting but Threatened”. For the goal to Protect and Enhance Public Health, 16 shoreline miles were assessed for swimming. Of this total, 5 miles were “Fully Supporting” and 11 miles were “Partially Supporting” (Table A7). For the goal to Protect and Enhance Public Health, 2 shoreline miles were assessed for fish consumption and found “Not Supporting” (Table A7).

vi. Wetlands Assessment

No change since the 2000 narrative 305b report. The American Samoa Wetland/Stream Restoration and Enhancement Plan has been completed. The plan is being implemented to restore selected wetland and riparian habitats. Habitat changes as a result of the plan implementation will be monitored and discussed in subsequent reports.

vii. Public Health/Aquatic Life Concerns

No change since the 2000 narrative 305b report.

IV Groundwater Assessment

Tables 18 to 21 below report on the quality of the Tutuila, Ofu/Olosega and Ta’u aquifers that provides the majority of American Samoa’s ground water resources. Table 16 provides an overview of the most important sources of ground water contamination. Best professional judgment provided the methodology and justification for prioritization of the sources indicated. In the same table, letters in the third column correspond with the following factors used to select each contaminant source.

- A. Human health and/or environmental risk (toxicity)
- B. Size of population at risk
- C. Location of sources relative to drinking water sources
- D. Number and/or size of contaminant sources
- E. Hydrogeologic sensitivity
- F. Territorial findings, other findings
- H. Geographic distribution/occurrence

As well, letters in the fourth column correspond with the contaminants/classes of contaminants considered to be associated with each of the sources that was checked.

- A. Inorganic pesticides

- B. Organic pesticides
- C. Halogenated solvents
- D. Petroleum compounds
- E. Nitrate
- G. Salinity/brine
- H. Metals
- I. Radionuclides
- J. Bacteria
- K. Protozoa
- L. Viruses

Table 17 provides a summary of American Samoa's ground water protection efforts. Table 18 provides and ground water contaminant summary for the Tutuila aquifer. Tables 19-21 provide the occurrence of particular groups of contaminants.

Table 16: Major Sources of Ground Water Contamination, 2002.

Contaminant Source	Ten Highest Priority Sources	Factors Considered in Selecting a Contaminant Source	Contaminants
<i>Agricultural Activities</i>			
Agricultural chemical facilities			
Animal feedlots	x	A,B,C,D,E,G	E,J,K,L
Drainage wells			
Fertilizer applications	x	A,B,C,D,E,G	E,J,K,L
Irrigation practices			
Pesticide applications	x	A,B,C,D,E,G	A,B
On-farm agricultural mixing and loading procedures			
Land application of manure (unregulated)			
<i>Storage and Treatment Activities</i>			
Land application (regulated or permitted)			
Material stockpiles			
Storage tanks (above ground)			
Storage tanks (underground)	x	A,B,C,D,E,G	D
Surface impoundments			
Waste piles			
Waste tailings			
<i>Disposal Activities</i>			
Deep injection wells			
Landfills	x	A,E	A,B,C,D,E,H,I,J, K,L
Septic systems	x	A,B,C,D,E,G	E,J,K,L
Shallow injection wells			
<i>Other</i>			
Hazardous waste generators			
Hazardous waste sites			
Large industrial facilities			
Material transfer operations			
Mining and mine drainage			
Pipelines and sewer lines	x	A,B,C,D,E,G	E,J,K,L
Salt storage and road salting			
Salt water intrusion	x	A,B,C,D,E,F,G	G
Spills			
Transportation of materials			
Urban runoff	x	A,B,C,D,E,G	C,D
Small-scale manufacturing and repair shops	x	A,C,E,G	C,D,H
Other sources (please specify)			

Table 17: Summary of American Samoa's Ground Water Protection Programs, 2002.

Programs or Activities	Check	Implementation Status	Responsible State Agency
Active SARA Title III Program	x	under development	ASEPA/TEMCO
Ambient ground water monitoring system			
Aquifer vulnerability assessment	x	under development	ASEPA/ASPA
Aquifer mapping	x	under development	ASEPA/ASPA
Aquifer characterization	x	under development	ASEPA/ASPA
Comprehensive data management system	x	under development	ASEPA/ASPA
EPA-endorsed Core Comprehensive State Ground Water Protection Program (CSGWPP)	x	under development	ASEPA/ASPA
Ground water discharge permits			
Ground water Best Management Practices	x	under development	ASEPA/ASPA
Ground water legislation	x	fully established	ASEPA/ASPA
Ground water classification	x	under development	ASEPA/ASPA
Ground water quality standards	x	under development	ASEPA/ASPA
Interagency coordination for ground water protection initiatives	x	under development	ASEPA/ASPA
Non point source controls	x	fully established	ASEPA/ASPA/DOC
Pesticide State Management Plan			
Pollution Prevention Program	x	under development	ASEPA
Resource Conservation and Recovery Act (RCRA) Primacy			
Source Water Assessment Program			
State Superfund			
State RCRA Program incorporating more stringent requirements than RCRA Primacy			
State septic system regulations	x	fully established	ASPA/Public Health
Underground storage tank installation requirements	x	fully established	ASEPA
Underground storage tank remediation fund			
Underground storage tank permit program	x	fully established	ASEPA
Underground injection control program			
Vulnerability assessment for drinking water/wellhead protection	x	under development	ASEPA/ASPA
Well abandonment regulations	x	fully established	ASEPA/ASPA
Wellhead Protection Program (EPA approved)	x	under development	ASEPA/ASPA
Well installation regulations	x	fully established	ASEPA/ASPA
Other programs or activities (please specify)			

Table 18: Ground Water Contamination Summary, 2002

Hydrogeologic Setting

Data Reporting Period

Source Type	Number of Sites	Number of sites that are listed and/or have confirmed releases	Number of sites with confirmed ground water contamination	Contaminants	Number of site investigations	Number of sites that have been stabilized or have had the source removed	Number of sites with corrective action plans	Number of sites with active remediation	Number of sites with cleanup completed
NPL	0								
CERCLIS (non-NPL)	0								
DOD/DOE	2	2	0	Petroleum	2	1	2	0	1
LUST	1	1	0	Diesel	1	1	1	0	1
RCRA Corrective Action	0								
Underground Injection	0								
State Sites	3	3	0	PCB, Petroleum	3	1	3	3	0
Non-Point Sources	0								
Other (specify)	0								

NPL - National Priority List

CERCLIS (non-NPL) - Comprehensive Environmental Response, Compensation, and Liability Information System

DOE - Department of Energy

DOD - Department of Defense

LUST - Leaking Underground Storage Tanks

Table 19. Aquifer Monitoring Data, 2002.

Hydrogeologic Setting: Ofu/Olosega

Data Reporting Period: 2001

Monitoring Data Type	Total No. of Wells Used in the Assessment	Parameter Groups	Number of Wells									
			No detections of parameters above MDLs or background levels		Nitrate concentrations range from background levels to less than or equal to 5 mg/l AND No detections of parameters other than nitrate above MDLs or background levels and/or located in areas that are sensitive or vulnerable		Nitrate ranges from greater than 5 to less than or equal to 10 mg/l OR Other parameters are detected at concentrations exceeding the MDLs but less than or equal to the MCLs		One or more parameters are detected at concentrations exceeding the MCLs	Number of Wells Removed from service	Number of wells Requiring Special Treatment	Background parameters exceed MCLs
			N D	Number of wells in sensitive or vulnerable areas (optional)	Nitrate ≤ 5mg/l AND VOC, SOC, and other parameters not detected	Number of wells in sensitive or vulnerable areas (optional)						
Untreated Water Quality Data from Public Water Supply Wells		VOC										
		SOC										
		NO ₃										
		Other										
Finished Water Quality Data from Public Water Supply Wells	2	VOC										
		SOC										
		NO ₃										
		Other						2			2	

Table 20. Aquifer Monitoring Data, 2002.

Hydrogeologic Setting: Ta'u

Data Reporting Period: 2001

Monitoring Data Type	Total No. of Wells Used in the Assessment	Parameter Groups	Number of Wells									
			No detections of parameters above MDLs or background levels		Nitrate concentrations range from background levels to less than or equal to 5 mg/l AND No detections of parameters other than nitrate above MDLs or background levels and/or located in areas that are sensitive or vulnerable		Nitrate ranges from greater than 5 to less than or equal to 10 mg/l OR Other parameters are detected at concentrations exceeding the MDLs but less than or equal to the MCLs	One or more parameters are detected at concentrations exceeding the MCLs	Number of Wells Removed from service	Number of wells Requiring Special Treatment	Background parameters exceed MCLs	
			N D	Number of wells in sensitive or vulnerable areas (optional)	Nitrate ≤ 5mg/l AND VOC, SOC, and other parameters not detected	Number of wells in sensitive or vulnerable areas (optional)						
Untreated Water Quality Data from Public Water Supply Wells		VOC										
		SOC										
		NO ₃										
		Other										
Finished Water Quality Data from Public Water Supply Wells	2	VOC										
		SOC										
		NO ₃										
		Other						2			2	

Table 21. Aquifer Monitoring Data, 2002.

Hydrogeologic Setting: Tutuila

Data Reporting Period: 2001

Monitoring Data Type	Total No. of Wells Used in the Assessment	Parameter Groups	Number of Wells									
			No detections of parameters above MDLs or background levels		Nitrate concentrations range from background levels to less than or equal to 5 mg/l AND No detections of parameters other than nitrate above MDLs or background levels and/or located in areas that are sensitive or vulnerable		Nitrate ranges from greater than 5 to less than or equal to 10 mg/l OR Other parameters are detected at concentrations exceeding the MDLs but less than or equal to the MCLs		One or more parameters are detected at concentrations exceeding the MCLs	Number of Wells Removed from service	Number of wells Requiring Special Treatment	Background parameters exceed MCLs
			N D	Number of wells in sensitive or vulnerable areas (optional)	Nitrate ≤ 5mg/l AND VOC, SOC, and other parameters not detected	Number of wells in sensitive or vulnerable areas (optional)						
Untreated Water Quality Data from Public Water Supply Wells		VOC										
		SOC										
		NO ₃										
		Other										
Finished Water Quality Data from Public Water Supply Wells	40	VOC										
		SOC										
		NO ₃										
		Other				27	13			40		

V Appendix A

Table A1: Summary of American Samoa Water Quality Standards, 2002.

Parameters	Fresh Surface Waters	Embayments	Pago Harbor Embayment	Embayments (Fagatele Bay and Pala Lagoon)	Open Coastal Waters	Ocean Waters
Temperature	-not to deviate more than 1.5 °F from ambient and not to fluctuate more than 1 °F on an hourly basis or to exceed 85 °F (except when due to natural causes)					
Light Penetration Depth	not < 65.0 ft (to exceed given value 50% of the time)	not < 120.0 ft (to exceed given value 50% of the time)	not < 65.0 ft (to exceed given value 50% of the time)	not < 130.0 ft (to exceed given value 50% of the time)	not < 130.0 ft (to exceed given value 50% of the time)	not < 150.0 ft (to exceed given value 50% of the time)
pH	6.5-8.6 range (+/- 0.2 pH units of that which would naturally occur)	6.5-8.6 range (+/- 0.2 pH units of that which would naturally occur)	6.5-8.6 range (+/- 0.2 pH units of that which would naturally occur)	6.5-8.6 range (+/- 0.2 pH units of that which would naturally occur)	6.5-8.6 range (+/- 0.2 pH units of that which would naturally occur)	6.5-8.6 range (+/- 0.2 pH units of that which would naturally occur)
Dissolved Oxygen	not < 75% saturation or not <6.0 mg/L	not < 70% saturation or not <6.0 mg/L	not < 70% saturation or not <6.0 mg/L	not < 80% saturation or not <6.0 mg/L	not < 80% saturation or not <6.0 mg/L	not < 80% saturation or not <6.0 mg/L
Turbidity	not > 5.0 NTU	not > 0.35 NTU	not > 0.75 NTU	Fagatele Bay not >0.25 NTU; Pala Lagoon not >0.75 NTU	not > 0.25 NTU	not > 0.20 NTU
Chlorophyll-a	N/A	not >0.5 ug/L	not >1.0 ug/L	not >0.35 ug/L	not >0.25 ug/L	not >0.18 ug/L
Enterococcus / Fecal coliform	Fecal coliform geometric mean not >100 CFU/100 ml and instantaneous sample not >200 CFU/100 ml	Enterococcus geometric mean not >35 CFU/100 ml and instantaneous sample not >124 CFU/100 ml	Enterococcus geometric mean not >35 CFU/100 ml and instantaneous sample not >104 CFU/100 ml	Enterococcus geometric mean not >35 CFU/100 ml and instantaneous sample not >104 CFU/100 ml	Enterococcus geometric mean not >35 CFU/100 ml and instantaneous sample not >104 CFU/100 ml	Enterococcus geometric mean not >35 CFU/100 ml and instantaneous sample not >276 CFU/100 ml

Table A2: Criteria for Priority Toxic Pollutants in Territorial Water Bodies from the ASWQS, 2002.

Water Body	Criteria
Class 1 Surface Waters and Class 1G Groundwater	The concentration of toxic pollutants shall not exceed the more stringent of the continuous concentration criteria for freshwater or the human health concentration criteria for the consumption of water and organisms found in the most recent publication of toxics criteria in 40 CFR Part 131.36(b), as amended.
Class 2 Surface Water and Wetlands	The concentration of toxic pollutants shall not exceed the more stringent of the continuous concentration criteria for freshwater or the human health concentration criteria for the consumption of organisms found in the most recent publication of toxics criteria in 40 CFR Part 131.36(b), as amended.
All Embayments, Open Coastal Waters and Ocean Waters	Except as may be allowed by the EQC within a Zone of Mixing (S24.0207) the concentration of toxic pollutants shall not exceed the more stringent of the continuous concentration criteria for marine waters or the human health concentration criteria for the consumption of organisms found in the most recent publication of toxics criteria in 40 CFR Part 131.36(b), as amended.

Table A3: Individual Use Support Summary for Streams (miles), 2002.

Goals	Use	Size Assessed	Size Fully Supporting	Size Fully Supporting but Threatened	Size Partially Supporting	Size Not Supporting	Size Not Attainable
Protect & Enhance Ecosystems	Aquatic Life	48.25	0.75	30.0	15.5	2.0	0.0
Protect & Enhance Public Health	Fish Consumption	-	-	-	-	-	-
	Shellfishing	-	-	-	-	-	-
	Swimming	2.0	-	-	-	2.0	-
	Drinking Water	9.45	0	0	0	9.45	0.0
Social & Economic	Agricultural	*	*	*	*	*	*
	Cultural/Ceremonial	*	*	*	*	*	*

Notes:

zero (0) = Category applicable, but size of water in category is zero

dash (-) = Category applicable no data available

asterisk (*) = category not applicable

Table A4: Total Sizes of Waters Impaired by Various Cause/Stressor Categories, 2002.

Type of Waterbody: Streams

Cause/Stressor Category	Size of Waters by Contribution to Impairment (miles)	
	Major	Moderate/Minor
Cause/Stressor Unknown	-	-
Unknown Toxicity	-	-
Pesticides	-	-
Priority Organics	-	-
Non-point Organics	-	-
PCBs	-	-
Dioxins	-	-
Metals	-	-
Ammonia	-	-
Cyanide	-	-
Sulfates	-	-
Chloride	-	-
Other Inorganics	-	-
Nutrients	-	2.0
pH	-	5.0
Siltation	-	-
Organic Enrichment/low DO	2.0	15.5
Salinity/TDS/Chlorides	-	-
Thermal Modifications	*	*
Flow Alterations	-	-
Other Habitat Alterations	-	19.2
Pathogen Indicators	11.45	-
Radiation	*	*
Oil and Grease	-	-
Taste and Odor	-	-
Suspended Solids	-	-
Noxious Aquatic Plants (Macrophytes)	*	*
Excessive Algal Growth	-	4.0
Total Toxics	-	-
Turbidity	-	20.8
Exotic Species	-	-
Other (specify)	*	*

Notes: zero (0) = Category applicable, but size of water in category is zero

dash (-) = Category applicable no data available

asterisk (*) = category not applicable

Table A5. Total Sizes of Waters Impaired by Various Source Categories, 2002.

Type of Waterbody: Rivers and Streams

Source Category	Contribution to Impairment (miles)	
	Major	Moderate/Minor
Industrial Point Sources	-	-
Municipal Point Sources	-	-
Combined Sewer Overflows	-	-
Collection System Failure	13.45	26.5
Domestic Wastewater Lagoon	*	*
Agriculture	-	-
Crop-related sources	*	*
Grazing-related sources	*	*
Intensive Animal Feeding Operations	13.45	26.5
Silviculture	*	*
Construction	-	-
Urban Runoff/Storm Sewers	-	20.8
Resource Extraction	*	*
Land Disposal	-	-
Hydromodification	-	19.2
Habitat modification (non-hydromod)	-	3.4
Marinas and recreational Boating	*	*
Erosion from Derelict Land	-	-
Atmospheric Deposition	-	-
Waste Storage/Storage Tank Leaks	-	-
Leaking Underground Storage Tanks	-	-
Highway maintenance and Runoff	-	-
Spills (Accidental)	-	-
Contaminated Sediments	-	-
Debris and Bottom Deposits	-	-
Internal Nutrient Cycling (Primary lakes)	*	*
Sediment Resuspension	*	*
Natural Sources	-	20.8
Recreational And Tourism Activities	*	*
Salt Storage Sites	*	*
Groundwater Loadings	*	*
Groundwater Withdrawal	*	*
Other Specify	-	-
Unknown Source	*	-
Sources Outside State Jurisdiction		*

Notes: asterisk (*) = category not applicable

dash (-) = Category applicable no data available

zero (0) = Category applicable, but size of water in category is zero

TableA6: Summary of Fully Supporting, Threatened, and Impaired Streams, 2002.

Degree of Use Support	Assessment Category		Total Assessed Size (miles)
	Evaluated	Monitored	
Size Fully Supporting All assessed Uses	0.75	-	0.75
Size Fully Supporting All Assessed Uses but Threatened for at Least One Use	30.0	-	30.0
Size Impaired for One or More Uses	17.5	11.45	28.95
Size Not Attainable for Any Use and Not Included in the Line Items Above	*	*	*
Total Assessed	48.25	11.45	59.7
Notes: zero (0) = Category applicable, but size of water in category is zero dash (-) = Category applicable no data available asterisk (*) = category not applicable			

Table A7: Individual Use Support Summary for Embayments / Open Coastal Waters (shore miles), 2002.

Goals	Use	Size Assessed	Size Fully Supporting	Size Fully Supporting but Threatened	Size Partially Supporting	Size Not Supporting	Size Not Attainable
Protect & Enhance Ecosystems	Aquatic Life	13	0	13	0	0	0
Protect & Enhance Public Health	Fish Consumption	2	0	0	0	2	0
	Shellfishing	-	-	-	-	-	-
	Swimming	16	5	0	11	0	0
	Drinking Water	-	-	-	-	-	-
Social & Economic	Agricultural	*	*	*	*	*	*
	Cultural/Ceremonial	*	*	*	*	*	*

Notes:

zero (0) = Category applicable, but size of water in category is zero

dash (-) = Category applicable no data available

asterisk (*) = category not applicable

Table A8: Total Sizes of Waters Impaired by Various Cause/Stressor Categories, 2002.

Type of Waterbody: Embayments / Open Coastal Waters

Cause/Stressor Category	Size of Waters by Contribution to Impairment (shore miles)	
	Major	Moderate/Minor
Cause/Stressor Unknown	-	-
Unknown Toxicity	-	-
Pesticides	-	-
Priority Organics	-	-
Non-point Organics	-	-
PCBs	-	-
Dioxins	-	-
Metals	-	2
Ammonia	-	-
Cyanide	-	-
Sulfates	-	-
Chloride	-	-
Other Inorganics	-	-
Nutrients	-	13
PH	-	-
Siltation	-	-
Organic Enrichment/low DO	-	-
Salinity/TDS/Chlorides	-	-
Thermal Modifications	*	*
Flow Alterations	-	-
Other Habitat Alterations	-	-
Pathogen Indicators	-	11
Radiation	*	*
Oil and Grease	-	-
Taste and Odor	-	-
Suspended Solids	-	-
Noxious Aquatic Plants (Macrophytes)	*	*
Excessive Algal Growth	-	8
Total Toxics	-	-
Turbidity	-	13
Exotic Species	-	-
Other (specify)	*	*

Notes: zero (0) = Category applicable, but size of water in category is zero

dash (-) = Category applicable no data available

asterisk (*) = category not applicable

Table A9. Total Sizes of Waters Impaired by Various Source Categories, 2002.

Type of Waterbody: Embayments / Open Coastal Waters

Source Category	Contribution to Impairment (shore miles)	
	Major	Moderate/Minor
Industrial Point Sources	-	-
Municipal Point Sources	-	-
Combined Sewer Overflows	-	-
Collection System Failure	-	24
Domestic Wastewater Lagoon	-	-
Agriculture	-	13
Crop-related sources	*	*
Grazing-related sources	*	*
Intensive Animal Feeding Operations	-	24
Silviculture	*	*
Construction	-	-
Urban Runoff/Storm Sewers	-	-
Resource Extraction	*	*
Land Disposal	-	-
Hydromodification	-	-
Habitat modification (non-hydromod)	-	-
Marinas and recreational Boating	*	*
Erosion from Derelict Land	-	-
Atmospheric Deposition	-	-
Waste Storage/Storage Tank Leaks	-	-
Leaking Underground Storage Tanks	-	-
Highway maintenance and Runoff	-	-
Spills (Accidental)	-	-
Contaminated Sediments	-	2
Debris and Bottom Deposits	-	-
Internal Nutrient Cycling (Primary lakes)	*	*
Sediment Resuspension	*	*
Natural Sources	-	13
Recreational And Tourism Activities	*	*
Salt Storage Sites	*	*
Groundwater Loadings	*	*
Groundwater Withdrawal	*	*
Other Specify	-	-
Unknown Source	-	-
Sources Outside State Jurisdiction	*	*

Notes: asterisk (*) = category not applicable

dash (-) = Category applicable no data available

zero (0) = Category applicable, but size of water in category is zero

Table A10. Summary of Fully Supporting, Threatened, and Impaired Embayments / Open Coastal Waters, 2002.

Degree of Use Support	Assessment Category(miles)		Total Assessed Size (miles)
	Evaluated	Monitored ^a	
Size Fully Supporting All assessed Uses	0	0	0
Size Fully Supporting All assessed Uses butThreatened for at Least One Use	0	13	13
Size Impaired for One or More Uses	2	11	13
Size Not Attainable for Any Use and Not Included in the Line Items Above	0	0	0
Total Assessed	2	24	26

^amonitored for Recreational-Use using Enterococci

Notes: zero (0) = Category applicable, but size of water in category is zero

dash (-) = Category applicable no data available

asterisk (*) = category not applicable